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Sine-Gordon fields with non vanishing mass on Minkowski spacetime and equilibrium states

lundi 26 juin 2023 15:50 (35 minutes)

During this talk we shall discuss the construction of the massive Sine-Gordon field in the ultraviolet finite regime when the background is a two-dimensional Minkowski spacetime. The correlation functions of the model in the adiabatic limit will be obtained combining recently developed methods of perturbative algebraic quantum field theory with techniques developed in the realm of constructive quantum field theory over Euclidean spacetimes. More precisely, perturbation theory is used to represent interacting fields as power series in the coupling constant over the free theory. Adapting techniques like conditioning and inverse conditioning to spacetimes with Lorentzian signature, we shall see that these power series converge if the interaction Lagrangian has generic compact support. The latter observation implies also convergence in the strong operator topology in the GNS representations of states in which the system is analyzed. Finally, adapting the cluster expansion technique to the Lorentzian case, we shall see that the adiabatic limit of the correlation functions of the interacting equilibrium state at finite temperature (KMS state) is finite. The talk is based on a joint work with D. Bahns and K. Rejzner [arxiv.org:2103.09328]

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